

**REMARKS**

Reconsideration and allowance of the subject application in view of the foregoing amendments and the following remarks is respectfully requested.

Claims 1, 3-9, 11-16, 18-22, and 24-26 remain pending. Claims 2, 10, 17, and 23 have been canceled without prejudice or disclaimer and in order to advance prosecution. Claim 1 has been amended to include detecting at least one region of interest in the video frames and using the detected at least one region of interest in the video frames to perform the aligning step. Instant specification at page 9, lines 18-29. Claims 20, 21 and 22 have been similarly amended. Claims 24-26 have been added to secure an appropriate scope of protection to which applicant is believed entitled. Specifically, claim 24 includes the steps of determining a centroid for each detected region of interest in the video frames; comparing a determined centroid with a centroid of an adjacent video frame; if the difference between the compared centroids is below a preset error tolerance, setting a frame-to-frame distance offset based on said compared centroid difference; and wherein said aligning step includes aligning the interpolated video frames based on said set frame-to-frame distance offset. Claim 25 includes wherein said comparing step includes comparing pixel values within detected regions of interest; and wherein said setting step includes setting said frame-to-frame distance offset based on said compared pixel values. Claim 26 includes wherein the detecting step includes counting the number of on pixels within a region of interest and comparing the number to a preset threshold value to determine a region of interest.

Responsive to the Official Action mailed April 7, 2004, the following remarks regarding the pending claims are presented.

Brandt et al. (U.S. Patent 6,646,655, hereinafter referred to as Brandt) fails to render obvious the subject matter of claim 1 as Brandt fails to perform the order of steps recited in claim 1. For at least this reason and further reasons described below, claim 1 is patentable over Brandt and the rejection should be withdrawn.

First, Brandt extracts video input frames, then optionally aligns the extracted frames, upsamples the aligned frames, and averages the upsampled frames. At best, Brandt is ambiguous concerning whether an alignment step needs to be performed.

Further, Brandt explicitly describes the alignment step occurring after the upsampling step and not after the interpolation step as claimed in claim 1. Based on the placement of the

description of the relied upon registration stage in the Brandt disclosure, the aligning step of Brandt is performed, if it is performed at all, after extraction of the video frames and prior to additional processing steps. Performing alignment at this point, increases the memory storage requirements and the processing load needed to align the video frames as the frames have not been upsampled and interpolated.

Second, Brandt mentions in passing that registration vectors may be saved and later used; however, there is no description of when or for what later use the vectors would be applied. It would be improper hindsight based on the instant disclosure to assume that Brandt intended that the aligning step would occur after the video frames are upsampled and interpolated as in claim 1.

Third, Brandt fails to include a step of detecting at least one region of interest in the video frames and using the region of interest to align the video frames as claimed in claim 1.

For any of the above reasons, claim 1 is patentable over Brandt and the rejection of claim 1 should be withdrawn.

Claim 2 has been cancelled without prejudice or disclaimer.

With respect to claim 3, there is no motivation or reason identified in Brandt motivating a person of skill in the art to make the necessary changes in Brandt. “The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant’s specification, to make the necessary changes in the reference device.” Ex parte Chicago Rawhide Mfg. Co., 223 U.S.P.Q. 351, 353 (Bd. Pat. App. & Inter. 1984). See also MPEP §2144.04. The Examiner has failed to identify the required motivation or reason for the worker in the art to make the necessary changes.

Further, “[a] particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation.” In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). See MPEP §2144.05 B. Brandt fails to recognize the upsample factor as a result-effective variable.

The Examiner’s attention is directed to the present specification, specifically to page 11,

lines 1-5, wherein the specification describes the factor of 4 as found by the inventor to be optimal and yielding the most consistent results. Further, specific benefits of using a factor of four are described, as well as reasons for not using a higher factor. Specifically:

As depicted in Figures 10 and 11, the images are upsampled by factor 4. Other upsampling factors could be used, but the factor of 4 appears to be optimal, yielding the most consistent results. Less than 4 could be used, but the idea is to create the highest resolution possible. Using a factor greater than 4 will result in diminishing returns, in that the amount of memory and processor capacity required will not necessarily produce a sufficiently higher quality image. Specification at page 10, line 28 through page 11, line 5.

Further still, claim 3 depends from claim 1 and is patentable over Brandt for at least the reasons advanced above with respect to claim 1.

For either of the above reasons, it would not have been an obvious matter of design choice to modify the Brandt reference to use an up-sampling factor of four. Because the Brandt reference fails to include the specific limitation and does not render the limitation obvious, the rejection of claim 3 should be withdrawn.

Claims 4-9, 11-16, 18-19, and 24-26 depend, either directly or indirectly, from claim 1, include further important limitations, and are patentable over Brandt for at least the reasons advanced above with respect to claim 1. The rejection of claims 4-9, 11-16, 18-19, and 24-26 is respectfully requested to be withdrawn.

Claims 20-22 are patentable over Brandt for reasons similar to those advanced with respect to claim 1 above and the rejection of claims 20-22 should be withdrawn.

Further specifically, with respect to claims 24-26, Brandt fails to disclose determining and comparing centroids for detected regions of interest as claimed in claim 24. For at least this reason and the reasons advanced above, claims 24-26 are patentable over Brandt and the rejection should be withdrawn.

All objections and rejections having been addressed, it is respectfully submitted that the present application should be in condition for allowance and a Notice to that effect is earnestly solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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